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ABSTRACT

The administration of the University of Central Florida (UCF) has found a top-down formula that encourages the faculty to design, develop, and deliver World Wide Web-based academic courses. This paper describes the development of the program, including the growth of UCF, UCF student profiles, the UCF budget model, development of a distributed learning plan (i.e., the creation of the Center for Distributed Learning and the Course Development and Web Services office), and growth and current operations. The experiences and opinions of the author as he went through the processes of initial training, development, coding, and delivery of a Web course are then presented, including incentives, resources, rewards, faculty training, instructional design and coding, Web course delivery, and grading. Student perceptions and areas for improvement are also addressed. (Contains 15 references.) (MES)

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Academic Support for Web Course Development: A Successful Top-Down Strategy

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Abstract: The administration of the University of Central Florida has found a top-down formula that is successful at encouraging the faculty to design, develop, and deliver Web-based academic courses. This paper describes the history of the development of the program and reviews one faculty member's experiences in designing, developing, and delivering a Web-based graduate level course.

1. Growth of UCF

UCF has grown from an initial enrollment of just under 2,000 in 1968 to just under 30,000 during the 1998-1999 academic year. During recent times, a new academic building has been added almost every year, and parking garages are now taking the place of parking lots. Growth of the campus, the adjacent research park, and area business and industries have pushed the regional transportation infrastructures to the limits. As a result, the administration of the University of Central Florida has become very interested in nontraditional methods of course delivery, and travel-weary students have shown surprising support for some of the alternatives that have been offered.

UCF Student Profiles

Student Classification	Part-Time	Full-Time	Avg. Age
Freshman	347	4,782	18
Sophomore	1,092	3,428	22
Junior	1,701	3,691	24
Senior	3,993	5,209	27
Total Undergraduate	7,133	17,110	24
Beginning Graduate	2,481	1,002	32
Advanced Graduate	428	192	35
Total Graduate	2,909	1,194	32
Post-Baccalaureate	1,358	117	34
Total UCF	11,400	18,421	26

Figure 1: 1998-1999 UCF Student Profile

The statistics illustrated in Figure 1 show a significant part-time student body with average ages above what is commonly found in resident university settings. The higher than normal number of part-time students, and the higher than average ages of the students are typical of a modern metropolitan university. These are the students supporting the increasing demand for non-traditional course delivery strategies. Additional statistics can be accessed online at two locations:

University of Central Florida Public Relations (http://www.oir.ucf.edu/pubrel/facts/index.htm)
University of Central Florida Institutional Research and Planning Support (http://pegasus.cc.ucf.edu/~irps/)

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2. UCF Budget Model

The budget at UCF is similar to the budgets at many universities. It has objective, formula based components and subjective "special initiative" components. Some portions are based upon historic funding models that are older than UCF itself. What follows is a simplified and not completely accurate discussion of one of the more controversial aspects of the funding model

Perhaps the most divisive component of the budget is a formula that determines the base level of funding for the individual colleges. It is tied to productivity as measured by student credit hours and produces an output of administrative, faculty, and staff positions that can either be filled with real people or left unfilled, releasing the salary dollars for other purposes. Figure 2 is a greatly simplified illustration of this issue. For the sake of simplification, a number of additional factors such as advising loads and off-campus course activities have been excluded, although they also enter into the determination of the final number of faculty lines per college. The real-world results are similar to the simplified illustration though; it is very possible for the same initial level of student productivity to produce twice the funds in one college compared to another.

College	Sample SCH	Productivity Factor	Faculty Lines	Line Salaries	Dollars Generated
A	10000	1283	7.79	$55,000.00	$428,682.77
B	10000	1300	7.69	$90,000.00	$692,307.69
C	10000	987	10.13	$53,000.00	$536,980.75
D	10000	819	12.21	$68,000.00	$830,280.83
E	10000	1250	8.00	$58,000.00	$464,000.00

Figure 2: Sample of formula-based funding inequities

It can reasonably be argued that historically, some colleges have had to pay much higher faculty salaries than others in order to attract equally qualified people. However, the model intentionally produces more faculty lines than are normally filled by the colleges. The funding from the unfilled lines is converted into operating funds, and this is where it is possible for colleges to end up with major differences. For example, it can be argued that productivity-based funds that are not used to fill faculty lines in a "have" college can be used to purchase almost twice as many computers as similar funds in a "have not" college.

To counter some of the apparent inequities that are created by the formula-based funding model, significant funds are held in reserve to be awarded as special projects, or "specials" as they are commonly called. Although specials are awarded to all colleges, there is little evidence that they balance the apparent inequities in funding.

3. Development of a Distributed Learning Plan

Although many administrators at UCF acknowledge that the base model of funding is not perfect, there is no consensus upon how to improve it. Any changes that improve funding to colleges that appear to be under-funded will naturally reduce the proportion of funding to the other colleges. It is almost certain that no dean will build popularity within his or her college by willingly giving funds to other colleges. It is in this financial environment that the need to expand our distributed learning initiatives arose. The solution was to take the needed funds "off the top" of the budget.

3.1 Center for Distributed Learning (http://distrib.ucf.edu/cdl/home.html)

By the summer of 1997 a decision was made to provide a new service to the colleges and faculty of UCF. The Center for Distributed Learning was created under the office of the Vice Provost of Academic Programs. Funding for the center is taken off the top of the University budget, and its resources were made available to all faculty. The Center coordinates all distributed learning activities, including delivery technologies such as videotape, interactive television, electronic mail, and web-based instruction for the distant learner as well as traditional on-campus courses delivered in part through electronic media. For this paper, we focus upon the course development and delivery that uses the World Wide Web in whole or in part.

To "kick start" the Center, funds were set aside for internal grants that were given to faculty through a competitive grant program. The funds were sufficient to supply faculty with a state of the art desktop or laptop

computer, an adjunct to cover one course during the development semester, and a graduate assistant to help during the first time the course was taught during the next semester. The Center is now starting its third year, and it continues to fund at least 12 new course development projects each semester.

3.2 Course Development and Web Services (http://reach.ucf.edu/~coursdev/)

A second new office, Course Development and Web Services, was created under the Vice Provost of Information Technologies to provide direct faculty support in the design and development of new Web courses. This office, too, is funded off the top of the university budget. This office is available to all faculty, whether they have a course development grant or not, and whether they are working on their first or sixth Web-based course. A number of services are provided, including faculty training, assistance with course design, course coding, and trouble shooting. A faculty member can choose to design, develop, and code the course with a minimum of assistance, or the faculty member can supply the basic curricular content to the Course Development staff and let them do most of the work of getting the course online.

4. Growth and Current Operations (http://distrib.ucf.edu/dlucf/home.html)

There are two types of courses that are of particular interest when we discuss Web courses at the University of Central Florida. They are designated by specific section codes.

> **M Sections.** Courses that contain an M in their section number have at least half of their content offered through the Web. They are structured in such a way that a single classroom time slot can be used to support the in-class time of two or more M courses by alternating the course meeting dates. This allows more efficient use of on campus classroom space
> **W Sections.** Courses that contain a W in their section number are offered through the World Wide Web. They require only minimal visits to a campus. For example, the only visit might be for an in-person final exam.

The offices of the Center for Distributed Learning and Course Development and Web Services are just two years old now, so it is difficult to determine any clear patterns at this point. However, the Figure 3 summarizes the number of students who have taken courses that have significant Web components. Web courses are now offered by all five colleges. This represents a very solid argument for providing open access to campus-wide offices that are funded off the top of the university budget.

	Fall 1997	Spring 1998	Summer 1998	**Total 97 - 98**	Fall 1998	Spring 1999	Summer 1999	**Total 98 - 99**
Students in "M" Sections	3700	2250	749	**6699**	5758	4293	1324	**11375**
Students in "W" Sections	392	691	667	**1750**	968	1407	1585	**3960**

Figure 3: Students enrolled in "M" and "W" course sections over the first two years

5. Web Courses from the Faculty Perspective

The paper up to this point has provided a background to the driving forces and current state of Web course development at the University of Central Florida. What follows are the experiences and opinions of this faculty member as he went through the processes of initial training, development, coding, and delivery of a Web course. It is said that trying to get faculty to do anything new will be futile unless three conditions are present: incentives, resources, and rewards.

5.1 Incentives

The perceived incentives are certain to vary from one faculty member to another. However, the UCF Web course development program has made it likely that many faculty will find some form of incentives. For many, the incentive of the grant – recognition, released time from teaching, graduate student assistance, and funding – serves as sufficient motivation to get going. My case is a bit different. I was on a sabbatical and did not need released

time. I'm a full professor and don't really need much more recognition, and I have an adequate computer system at my desk. However, there were still incentives.

I teach courses in a graduate Instructional Technology program. In fact, a number of my current and former students are now employees of Course Development and Web Services. With a number of faculty around me getting involved in Web courses, I was starting to feel a bit outdated. It occurred to me that a sabbatical was the perfect time to get caught up.

I work a great deal with multimedia technologies, and I'm uncomfortable talking about technologies in my classes unless I've actually worked with them. I was being asked more and more questions about Web-based training by my industry and military students, and I was having trouble finding answers. What better way to speak with authority than to use your own Web course as an example?

5.2 Resources

The UCF Web course development program provides outstanding resources. In fact, first exposure to the number of resources can be overwhelming. As previously mentioned, a faculty member with an internal development grant gets an adjunct to cover a course to provide released time, funding for computer equipment, and graduate assistant support. Beyond that however, any faculty member has numerous resources available.

IDL 6543 (http://reach.ucf.edu/~idl6543/) is an intensive, almost formal course that is taught by the Course Development staff. Portions are lecture / discussion, laboratory, and Web-based. It is open to any faculty member, but it is required for those who are awarded the internal grants for Web course development. The course covers a wide range of topics relating to Web course attributes, course design, course coding, and implementation. Projects during IDL 6543 result in the actual development of significant portions of a Web course.

WebCT Academy (http://reach.ucf.edu/~webct411/) is a series of Course Development workshops that provide a range of experiences with WebCT (http://www.webct.com/webct/), the course development, delivery, and management tool used at UCF. The workshops range from introductory overviews of WebCT through intensive authoring and management tasks.

Pegasus Connections CDROM (http://reach.ucf.edu/~coursdev/cdrom) is a modern faculty and student resource that contains almost every document or link that you can imagine. It also contains basic Web course training for students and faculty, and it has a number of licensed programs and plug-ins that are commonly used with Web browsers. It is given to faculty who are teaching Web courses, and it is sold to students for a minimal $5.00 charge.

Finally, the Office of Course Development and Web Services supplies a wealth of resources in the form of talented people. There are instructional designers, graphic artists, course programmers, technical problem solvers, and others. Faculty who are new at developing Web courses are linked to a primary contact who serves as the facilitator throughout course design, development, and delivery.

5.3 Rewards

Standards have evolved over the last few years at UCF. While in the past there was a very clear "technology penalty" for working with or producing anything that was not ink on paper, that is not the case now. Successful innovation in course development and delivery is now viewed as an important component in the tenure and promotion processes at both the college and university levels. A successful implementation of a technology mediated course is often considered the equal of a refereed research journal article.

At the end of each course development cycle, the new courses are demonstrated at a luncheon ceremony. Deans, department chairs, and faculty attend, and faculty give short presentations that highlight key aspects of their courses. Deans and chairs have frequently commented that the presentations have really made them aware of the outstanding efforts that have gone into the course production activities.

6. EME 6062 – Course Design, Development and Delivery

The remainder of this paper provides documentation into the amount of time required to develop and deliver a Web course. Figure 4 provides a summary chart of the time spent on various tasks. I am a "typical" faculty member in most ways. I know my course content very well. I know how students react to various parts of my courses. I have a number of courses to teach. I advise students, and I work on many different types of committees. However, I am probably not a typical faculty member when it comes to technology-based course

development. I teach the process of instructional design, and I teach computer-based authoring systems. I chose to do much of the Web course development on my own so that I could better understand what is involved.

EME 6062 Web Development and Delivery
Hours on Tasks

	Faculty Training	Course Development	Course Coding	Forums Email	Grading	Totals
Spring '99	68	75	75	43	45	306
Summer '99	4	2	2	*	*	*

* Incomplete data

Figure 4: Hours required to perform specific tasks in course development

6.1 Facutly Training - IDL 6543

This is the quasi-formal course for faculty who are developing Web-based content. It has lecture, lab, and online components. There are assigned activities, and products that must be turned in. During this course the faculty member learns to use the prescribed tools and techniques that are supported at UCF for Web course development and delivery. This was a very interesting course for me, in that I was a student of some of my former students. I found that they had no problem treating me as "one of the faculty," and I found that I was soon interacting with them as a peer.

Probably the most rewarding aspect of this course was the interaction with a variety of faculty from across the campus. While I knew technology very well, I quickly learned that some of the faculty from Arts and Science had far better ideas about successful communication and presentation strategies than I did. The "cross fertilization" of academic disciplines was most rewarding. The total time required to complete the course was approximately 72 hours, divided almost equally between lecture sessions, lab sessions, and online time. There were also a few minor training components relating to WebCT advanced features and course recycling that are included in this figure.

6.2 Instructional Design and Coding

I selected a graduate research literature course (http://reach.ucf.edu/~eme6062/) for development into a Web delivery format. To address accreditation issues, the course has two "in person" meetings. One is at the start of the course to meet the students and provide a basic course indoctrination, and the other is for an "in person" final exam. For students who are distant, the final exam can be proctored by a faculty member at a local university or community college. The Web section of the course is now finishing its second cycle. During the spring semester, 1999 the first Web section was offered concurrently with a traditional section and students were given their choice of taking either. There were 24 students in the Web section and a similar number in the traditional section. During summer session, enrollments are typically lower. Only the Web section of the course is being offered, and there are 16 students enrolled.

Probably the greatest surprise for me was the amount of "new" course material that was required in order for the traditional course to become a Web-based course. Although I had heard the warning a number of times, I was not initially prepared for the effort it took to create a Web course that provided experiences similar to the traditional course. Web course design is not simply a process of converting your course notes to electronic format! The time spent on course design was approximately 75 hours. However, the second time the Web course was taught, only 2 hours were required to correct some minor flaws.

Getting the course into the WebCT format was time consuming, but it was no different that learning a new authoring system. The content of the course is stored in HTML format. Although WebCT provides basic tools that convert text to HTML, I found in many cases it was faster and easier to edit directly in HTML code. Unless you are already familiar with authoring systems and HTML code, this is the one area that I would advise faculty to turn over to the technical programmers. Course coding took approximately 75 hours. However, with proper materials at hand, one of the course programmers probably could have completed the task in less than half the time. The second time the course was taught, only an additional 2 hours of coding were required to make some minor corrections, update some Web links, and reset the course for the new students.

6.3 Web Course Delivery

There are two face-to-face meetings with the students. The first is a course orientation at the beginning of the semester. This orientation covers general University procedures for Web courses, and specific procedures for this course. Since this course relies very heavily upon electronic library resources, there is an electronic library orientation. At the end of the course, there is a standard "in person" final exam. Student ID's are checked to confirm their identity, and they then take a comprehensive course final exam. The face-to-face components take a total of about 8 hours each time the course is taught.

The primary methods of communication with the students are through email, forums, and online interactive chat sessions. The total time spent during the first time the course was offered is 35 hours, with 3 of those being online chats. At this time, the second session of the course is not complete, but it appears that the "communication" time will be slightly lower. This is almost certainly due to the lower summer enrollment in the course. The level of communication time seems closely related to the number of students in the course.

6.4 Grading

This is a graduate research literature course, so the students produce quite a bit of literature. The first quiz is graded by WebCT because it is completely objective, but all remaining work requires some level of "hand" grading. By far the most time consuming is the process of grading the final projects, which are literature reviews or annotated bibliographies. Grading for the spring semester course took approximately 45 hours, but it is expected that this number will be lower for summer term due to the reduced enrollment.

7. Student Perceptions

Since this course has run through completion only one time so far, insufficient data have been collected to provide a clear picture of student attitudes and performance. From the information collected, students considered the course to be about the same amount of work as similar traditional graduate courses that they have completed. They had a few frustrations dealing with technical details of getting everything started, but once they were underway they liked being able to work at home on their own terms. The final grade distribution appears to be very similar to those of the traditional sections of this course.

Faculty and staff are conducting research regarding student attitudes and over-all effectiveness of our online courses. Much of this research can be viewed online at (http://reach.ucf.edu/~research/). In general, students like Web courses. They have had frustrations with slow connections to campus, but recent campus Internet connection improvements seem to have reduced those problems. Preliminary research is indicating that there do appear to be differences in attitudes among the students based upon personality and learning style measures.

8. Things to Improve Upon

Perhaps the greatest problem is the limited physical space that is available to the Course Development and Web Services office. The rapid growth in staffing has resulted in three or four employees working in what would normally be considered a single office. There is little room for people or equipment, and the ventilation system is not capable of handling the load. Efforts are underway to locate additional space.

Rapid growth has also created confusing logistics. While many faculty do build and revise their own Web courses now, there are barriers to the process. The Web server that delivers the courses is also the Web server upon which courses are developed. Testing and debugging courses and associated programs have been known to bring down the entire server – something that can be very frustrating to students in the middle of other courses. A separate server is needed for course development and debugging. This would make it possible to implement the server side of Web page development software, something that is not now permitted.

The Center for Distributed Learning and the office of Course Development and Web Services are both very new. They have been positioned into an otherwise very traditional academic structure. There are confusing overlaps and contradictions in the missions of the two new offices and several older offices, including Faculty Training and Development, Instructional Resources, and Computer Services. Additional efforts should go into more clearly defining the roles of these offices, and improving information flow and cooperation among them.